Industrial Gases: 2003

Summary

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Current Industrial Reports

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These data are also available on Internet through the U.S. Department of Commerce and STAT-USA by subscription. The Internet address is: www.stat-usa.gov/. Follow the prompts to register. Also, you may call 202-482-1986 or 1-800-STAT-USA, for further information.

SUMMARY OF FINDINGS.

In 2003, total production of acetylene decreased to 1.59 billion cubic feet from the 2.62 billion cubic feet that was produced in 2002. Total value of shipments was $69.9 million, an increase of 23.9 percent from the previous year.

Total production of hydrogen remained constant in 2003, with production of 507.62 billion cubic feet. However, value of shipments of hydrogen decreased with a value of $901.2 million in 2003.

Total shipments of carbon dioxide decreased slightly to 12.3 million short tons in 2003, from 12.5 million short tons in 2002. This amount includes gas production of 6.2 million short tons in 2003, from 5.1 million short tons in 2002. Carbon dioxide liquid production was 5.7 million short tons in 2003, a decrease from 7.0 million short tons in 2002. Solid carbon dioxide (dry ice) production decreased by 49.3 thousand short tons in 2003 to 366.8 thousand short tons. Total value of shipments of carbon dioxide increased 11.9 percent.

Total production of nitrogen increased by 18.9 billion cubic feet in 2003 to 937.9 billion cubic feet. Value of shipments of nitrogen increased by 2.2 percent in 2003, from a value of $1,374.5 million in 2002.

Total production of oxygen increased to 697.74 billion cubic feet in 2003, from 605.75 billion cubic feet in 2002. Value of shipments of oxygen increased to $998.7 million in 2003, from $795.6 million the previous year.

For general CIR information, explanation of general terms and historical note, see the appendix.

Address inquiries concerning these data to Consumer Goods Industries Branch, Manufacturing and Construction Division (MCD), Washington, DC 20233-6900, or call John Linehan, 301-763-4742.

For mail or fax copies of this publication, please contact the Information Services Center, MCD, Washington, DC 20233-6900, or call 301-763-4673.

U S C E N S U S B U R E A U

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Table 1. Summary of Production of Principal Gases: 2003 to 2002
[Million cubic feet, except as noted]

Quarter and year	Acetylene (3251201)	Carbon dioxide [short tons] Total (3251204)	Carbon dioxide [short tons] Gas (3251204111)	Carbon dioxide [short tons] Liquid (3251204121)	Carbon dioxide [short tons] Solid (3251204131)	Argon high purity (325120D121)	Hydrogen, high and low purity (100 percent) (325120D pt.)	Nitrogen, high and low purity (100 percent) (3251207)	Oxygen, high and low purity (100 percent) (325120A)
2003									
Total	1,591	12,299,321	6,236,115	5,696,359	366,847	21,459	507,624	937,856	697,741
Fourth quarter	423	3,091,154	1,687,654	1,314,801	88,699	5,476	130,444	234,510	184,634
Third quarter	399	3,506,292	1,673,980	1,728,245	104,067	5,630	127,608	237,108	176,239
Second quarter	405	2,953,077	1,428,567	1,432,718	91,792	5,131	128,720	232,775	171,372
First quarter	365	2,748,798	1,445,914	1,220,595	82,289	5,221	120,852	233,463	165,496
2002									
Total	2,618	12,505,224	5,081,134	7,007,979	416,111	18,661	478,533	918,983	605,745
Fourth quarter	655	3,032,514	1,400,966	1,529,974	101,574	5,444	117,209	235,778	168,557
Third quarter	663	3,173,584	1,216,568	1,841,967	115,049	3,994	116,423	201,053	137,290
Second quarter	656	3,250,814	1,262,040	1,884,245	104,529	4,776	127,247	237,543	155,120
First quarter	644	3,048,312	1,201,560	1,751,793	94,959	4,447	117,654	244,609	144,778

pt. Part.

Table 2a. Total Primary Production of Specified Industrial Gases: 2003
[Quantity in million cubic feet, unless otherwise noted. Value in thousands of dollars]

Product code	Product description	Quantity produced	Quantity shipped	Value of shipments	Quantity produced and consumed in plant
	TOTAL 2003				
3251201	Acetylene	1,591	1,467	69,862	(Z)
3251201111	Produced for compression, including cylinder and pipeline	(D)	(D)	(D)	(X)
3251201121	Produced for pipeline shipment, excluding that shipped to be compressed, and for consumption in same plant	(D)	(D)	(D)	(Z)
3251204	Carbon dioxide (short tons)	12,299,321	13,403,766	459,763	476,691
3251204111	Gas, including amounts produced and liquefied	6,236,115	5,623,971	(D)	(D)
3251204121	Liquid, including amounts produced and and used to make dry ice	5,696,359	7,407,645	(D)	(D)
3251204131	Solid (dry ice)	366,847	372,150	29,326	(D)
325120D121	Argon, high purity: Produced for cylinder and bulk delivery and pipeline shipments, and for consumption in same plant	21,459	23,682	396,302	(D)
325120D pt.	Hydrogen	507,624	355,112	901,164	105,740
	Gas produced for:				
325120D131	Merchant shipment	738	(S)	(S)	(X)
325120D141	Pipeline and on-site use	333,686	336,533	744,353	(X)
325120D151	Consumption in same plant	155,628	(X)	(X)	105,740
	Liquid produced for:				
325120D161	Merchant shipment	(D)	(D)	(D)	(X)
325120D171	Other shipments or uses	(D)	(D)	(D)	(X)
3251207	Nitrogen	937,856	860,262	1,405,104	9,803
	Gas produced by:				
3251207111	Cryogenic on-site and pipeline	584,398	577,143	439,127	(X)
3251207121	Noncryogenic processes by industrial gas producing companies, including psa, vpsa, membrane, etc.	(D)	(D)	(D)	(X)
	Captive uses for consumption in same plant (user owned):				
3251207131	Cryogenic processes	18,908	(X)	(X)	4,315
3251207141	Noncryogenic processes, including psa, vpsa, membrane, etc.	(D)	(X)	(X)	(D)
	Liquid produced for:				
3251207151	Merchant shipment	280,035	240,749	(S)	(X)
3251207161	Consumption in same plant	11,235	(X)	(X)	(D)
3251207171	Other shipments or uses	31,046	(D)	(D)	(X)
325120A	Oxygen	697,741	611,529	998,680	(D)
	Gas produced by:				
325120A111	Cryogenic on-site and pipeline	505,217	(S)	(S)	(X)
325120A121	Noncryogenic processes by industrial gas producing companies, including psa, vpsa, membrane, etc.	(D)	(D)	(D)	(X)
	Captive uses for consumption in same plant (user owned):				
325120A131	Cryogenic processes	(D)	(X)	(X)	(D)
325120A141	Noncryogenic processes, including psa, vpsa, membrane, etc.	(D)	(X)	(X)	(D)
	Liquid produced for:				
325120A151	Merchant shipment	108,250	103,070	232,137	(X)
325120A161	Consumption in same plant	(D)	(X)	(X)	(D)
325120A171	Other shipments or uses	28,391	(D)	(D)	(X)

Continued

Table 2a. Total Primary Production of Specified Industrial Gases: 2003
[Quantity in million cubic feet, unless otherwise noted. Value in thousands of dollars]

Product code	Product description		Quantity produced		Quantity shipped		Value of shipments	Quantity produced and consumed in plant
	FOURTH QUARTER 2003							
3251201	Acetylene		423		368	r/	15,239	(Z)
3251201111	Produced for compression, including cylinder and pipeline		(D)		(D)		(D)	(X)
3251201121	Produced for pipeline shipment, excluding that shipped to be compressed, and for consumption in same plant		(D)		(D)		(D)	(Z)
3251204	Carbon dioxide (short tons)		3,091,154		3,410,432		120,385	(D)
3251204111	Gas, including amounts produced and liquefied	b/	1,687,654	c/	1,517,282	c/r/	13,743	(D)
3251204121	Liquid, including amounts produced and and used to make dry ice	b/	1,314,801	c/	1,803,274		(S)	(D)
3251204131	Solid (dry ice)	c/	88,699	c/	89,876	c/	6,841	(D)
325120D121	Argon, high purity: Produced for cylinder and bulk delivery and pipeline shipments, and for consumption in same plant	b/	5,476	c/r/	6,049	c/r/	101,112	(D)
325120D pt.	Hydrogen		130,444		88,547	r/	210,197	28,784
	Gas produced for:							
325120D131	Merchant shipment	b/	182	c/	248	b/	1,920	(X)
325120D141	Pipeline and on-site use	b/	84,515	b/	83,859	c/r/	172,163	(X)
325120D151	Consumption in same plant		41,311		(X)		(X)	28,784
	Liquid produced for:							
325120D161	Merchant shipment		(D)		(D)		(D)	(X)
325120D171	Other shipments or uses		(D)		(D)		(D)	(X)
3251207	Nitrogen		234,510		220,158	r/	355,295	2,197
	Gas produced by:							
3251207111	Cryogenic on-site and pipeline	a/	146,768	a/	144,993	c/	110,708	(X)
3251207121	Noncryogenic processes by industrial gas producing companies, including psa, vpsa, membrane, etc.		(D)		(D)		(D)	(X)
	Captive uses for consumption in same plant (user owned):							
3251207131	Cryogenic processes		1,470		(X)		(X)	(D)
3251207141	Noncryogenic processes, including psa, vpsa, membrane, etc.		(D)		(X)		(X)	(D)
	Liquid produced for:							
3251207151	Merchant shipment	c/	72,153	b/	63,512		(S)	(X)
3251207161	Consumption in same plant		2,429		(X)		(X)	(D)
3251207171	Other shipments or uses	a/	8,641	c/	(D)		(D)	(X)
325120A	Oxygen		184,634		162,005	r/	263,314	(D)
	Gas produced by:							
325120A111	Cryogenic on-site and pipeline	b/	134,353	a/	121,573		(S)	(X)
325120A121	Noncryogenic processes by industrial gas producing companies, including psa, vpsa, membrane, etc.		(D)		(D)		(D)	(X)
	Captive uses for consumption in same plant (user owned):							
325120A131	Cryogenic processes		(D)		(X)		(X)	(D)
325120A141	Noncryogenic processes, including psa, vpsa, membrane, etc.		(D)		(X)		(X)	(D)
	Liquid produced for:							
325120A151	Merchant shipment	c/	27,967	c/	27,008	c/	55,341	(X)
325120A161	Consumption in same plant		(D)		(X)		(X)	(D)
325120A171	Other shipments or uses	b/	7,274		(D)		(D)	(X)

Continued

Table 2a. Total Primary Production of Specified Industrial Gases: 2003
[Quantity in million cubic feet, unless otherwise noted. Value in thousands of dollars]

Product code	Product description		Quantity produced		Quantity shipped		Value of shipments	Quantity produced and consumed in plant
	THIRD QUARTER 2003							
3251201	Acetylene		399		356	r/	13,923	(Z)
3251201111	Produced for compression, including cylinder and pipeline		(D)		(D)		(D)	(X)
3251201121	Produced for pipeline shipment, excluding that shipped to be compressed, and for consumption in same plant		(D)		(D)		(D)	(Z)
3251204	Carbon dioxide (short tons)		3,506,292		3,816,948		132,505	(D)
3251204111	Gas, including amounts produced and liquefied	b/	1,673,980	b/	1,549,395	c/	14,347	(D)
3251204121	Liquid, including amounts produced and and used to make dry ice	b/	1,728,245	c/	2,160,616		(S)	(D)
3251204131	Solid (dry ice)	c/	104,067	c/	106,937	c/	8,196	(D)
325120D121	Argon, high purity: Produced for cylinder and bulk delivery and pipeline shipments, and for consumption in same plant	b/	5,630	c/r/	5,802	c/r/	96,925	(D)
325120D pt.	Hydrogen		127,608		92,828	r/	231,562	24,639
	Gas produced for:							
325120D131	Merchant shipment	c/	175		(S)		(S)	(X)
325120D141	Pipeline and on-site use	b/	84,806	b/	88,115	a/r/	192,807	(X)
325120D151	Consumption in same plant		38,202		(X)		(X)	24,639
	Liquid produced for:							
325120D161	Merchant shipment		(D)		(D)		(D)	(X)
325120D171	Other shipments or uses		(D)		(D)		(D)	(X)
3251207	Nitrogen		237,108		214,794	r/	361,552	2,384
	Gas produced by:							
3251207111	Cryogenic on-site and pipeline	b/	144,876	b/	142,300	c/	109,190	(X)
3251207121	Noncryogenic processes by industrial gas producing companies, including psa, vpsa, membrane, etc.		(D)		(D)		(D)	(X)
	Captive uses for consumption in same plant (user owned):							
3251207131	Cryogenic processes		5,740		(X)		(X)	(D)
3251207141	Noncryogenic processes, including psa, vpsa, membrane, etc.		(D)		(X)		(X)	(D)
	Liquid produced for:							
3251207151	Merchant shipment	c/	72,505	b/	61,341		(S)	(X)
3251207161	Consumption in same plant		2,789		(X)		(X)	(D)
3251207171	Other shipments or uses	a/	8,306	c/	(D)		(D)	(X)
325120A	Oxygen		176,239		152,880	r/	241,875	(D)
	Gas produced by:							
325120A111	Cryogenic on-site and pipeline	b/	127,052	b/	114,820		(S)	(X)
325120A121	Noncryogenic processes by industrial gas producing companies, including psa, vpsa, membrane, etc.		(D)		(D)		(D)	(X)
	Captive uses for consumption in same plant (user owned):							
325120A131	Cryogenic processes		(D)		(X)		(X)	(D)
325120A141	Noncryogenic processes, including psa, vpsa, membrane, etc.		(D)		(X)		(X)	(D)
	Liquid produced for:							
325120A151	Merchant shipment	c/	27,951	c/r/	25,211	c/	54,210	(X)
325120A161	Consumption in same plant		(D)		(X)		(X)	(D)
325120A171	Other shipments or uses	b/	6,955		(D)		(D)	(X)

Continued

Table 2a. Total Primary Production of Specified Industrial Gases: 2003
[Quantity in million cubic feet, unless otherwise noted. Value in thousands of dollars]

Product code	Product description		Quantity produced		Quantity shipped		Value of shipments	Quantity produced and consumed in plant
	SECOND QUARTER 2003							
3251201	Acetylene		405		397	r/	21,174	(Z)
3251201111	Produced for compression, including cylinder and pipeline	c/	(D)		(D)		(D)	(X)
3251201121	Produced for pipeline shipment, excluding that shipped to be compressed, and for consumption in same plant		(D)		(D)		(D)	(Z)
3251204	Carbon dioxide (short tons)		2,953,077		3,177,737		109,727	(D)
3251204111	Gas, including amounts produced and liquefied	b/	1,428,567	b/	1,267,899	c/	12,154	(D)
3251204121	Liquid, including amounts produced and and used to make dry ice	b/	1,432,718	c/	1,816,668		(S)	(D)
3251204131	Solid (dry ice)	c/	91,792	c/	93,170	c/	7,626	(D)
325120D121	Argon, high purity: Produced for cylinder and bulk delivery and pipeline shipments, and for consumption in same plant	b/	5,131	c/r/	5,687	c/r/	91,183	(D)
325120D pt.	Hydrogen		128,720		89,762	r/	219,382	24,005
	Gas produced for:							
325120D131	Merchant shipment	b/	209	c/	279	b/	2,667	(X)
325120D141	Pipeline and on-site use	b/	87,059	b/	85,149	b/r/	179,291	(X)
325120D151	Consumption in same plant		37,103		(X)		(X)	24,005
	Liquid produced for:							
325120D161	Merchant shipment		(D)		(D)		(D)	(X)
325120D171	Other shipments or uses		(D)		(D)		(D)	(X)
3251207	Nitrogen		232,775		212,964	r/	338,661	2,502
	Gas produced by:							
3251207111	Cryogenic on-site and pipeline	a/	145,773	a/	144,738	c/	112,506	(X)
3251207121	Noncryogenic processes by industrial gas producing companies, including psa, vpsa, membrane, etc.		(D)		(D)		(D)	(X)
	Captive uses for consumption in same plant (user owned):							
3251207131	Cryogenic processes		5,504		(X)		(X)	(D)
3251207141	Noncryogenic processes, including psa, vpsa, membrane, etc.		(D)		(X)		(X)	(D)
	Liquid produced for:							
3251207151	Merchant shipment	c/	67,957	b/	57,940		(S)	(X)
3251207161	Consumption in same plant		2,743		(X)		(X)	(D)
3251207171	Other shipments or uses	a/	7,609	a/	(D)		(D)	(X)
325120A	Oxygen		171,372		148,138	r/	247,416	(D)
	Gas produced by:							
325120A111	Cryogenic on-site and pipeline	c/	124,712		(S)		(S)	(X)
325120A121	Noncryogenic processes by industrial gas producing companies, including psa, vpsa, membrane, etc.		(D)		(D)		(D)	(X)
	Captive uses for consumption in same plant (user owned):							
325120A131	Cryogenic processes		(D)		(X)		(X)	(D)
325120A141	Noncryogenic processes, including psa, vpsa, membrane, etc.		(D)		(X)		(X)	(D)
	Liquid produced for:							
325120A151	Merchant shipment	c/	25,989	c/	25,513	c/	64,342	(X)
325120A161	Consumption in same plant		(D)		(X)		(X)	(D)
325120A171	Other shipments or uses	c/	6,997		(D)		(D)	(X)

Continued

Table 2a. Total Primary Production of Specified Industrial Gases: 2003
[Quantity in million cubic feet, unless otherwise noted. Value in thousands of dollars]

Product code	Product description	Quantity produced	Quantity shipped	Value of shipments	Quantity produced and consumed in plant
	FIRST QUARTER 2003				
3251201	Acetylene	365	346 r/	19,526	(Z)
3251201111	Produced for compression, including cylinder and pipeline	(D)	(D)	(D)	(X)
3251201121	Produced for pipeline shipment, excluding that shipped to be compressed, and for consumption in same plant	(D)	(D)	(D)	(Z)
3251204	Carbon dioxide (short tons) r/	2,748,798	2,998,649	97,146	96,080
3251204111	Gas, including amounts produced and liquefied b/r/	1,445,914	b/ 1,289,395	(D)	(D)
3251204121	Liquid, including amounts produced and and used to make dry ice b/	1,220,595	c/ 1,627,087	(D)	(D)
3251204131	Solid (dry ice) c/	82,289	c/ 82,167	c/ 6,663	(D)
325120D121	Argon, high purity: Produced for cylinder and bulk delivery and pipeline shipments, and for consumption in same plant b/	5,221	c/r/ 6,144	c/r/ 107,082	(D)
325120D pt.	Hydrogen	120,852	83,975 r/	240,023	28,311
	Gas produced for:				
325120D131	Merchant shipment b/	172	c/ 218	b/ 1,860	(X)
325120D141	Pipeline and on-site use b/r/	77,306	b/ 79,409	c/r/ 200,092	(X)
325120D151	Consumption in same plant b/	39,012	(X)	(X)	b/ 28,311
	Liquid produced for:				
325120D161	Merchant shipment	(D)	(D)	(D)	(X)
325120D171	Other shipments or uses	(D)	(D)	(D)	(X)
3251207	Nitrogen	233,463	212,346 r/	349,596	2,720
	Gas produced by:				
3251207111	Cryogenic on-site and pipeline a/	146,981	a/ 145,113	c/ 106,723	(X)
3251207121	Noncryogenic processes by industrial gas producing companies, including psa, vpsa, membrane, etc.	(D)	(D)	(D)	(X)
	Captive uses for consumption in same plant (user owned):				
3251207131	Cryogenic processes	6,194	(X)	(X)	(D)
3251207141	Noncryogenic processes, including psa, vpsa, membrane, etc.	(D)	(X)	(X)	(D)
	Liquid produced for:				
3251207151	Merchant shipment c/	67,421	b/ 57,955	(S)	(X)
3251207161	Consumption in same plant	3,273	(X)	(X)	(D)
3251207171	Other shipments or uses b/	6,490	b/ (D)	(D)	(X)
325120A	Oxygen	165,496	148,506 r/	246,075	(D)
	Gas produced by:				
325120A111	Cryogenic on-site and pipeline b/	119,101	a/ 110,264	(S)	(X)
325120A121	Noncryogenic processes by industrial gas producing companies, including psa, vpsa, membrane, etc.	(D)	(D)	(D)	(X)
	Captive uses for consumption in same plant (user owned):				
325120A131	Cryogenic processes	(D)	(X)	(X)	(D)
325120A141	Noncryogenic processes, including psa, vpsa, membrane, etc.	(D)	(X)	(X)	(D)
	Liquid produced for:				
325120A151	Merchant shipment c/	26,343	c/ 25,338	c/ 58,244	(X)
325120A161	Consumption in same plant	(D)	(X)	(X)	(D)
325120A171	Other shipments or uses b/	7,166	(D)	(D)	(X)

D Withheld to avoid disclosing data for individual companies. pt. Part. r/Revised by5 percent or more from previously published data. S Does not meet publication standards. X Not applicable. Z Equals less than one.

Note: Percent of estimation of each item is indicated as follows: a/10 to 25 percent of this item is estimated. b/26 to 50 percent of this item is estimated. c/Over 50 percent of this item is estimated.

Continued

Table 2b. Primary Production of Specified Industrial Gases: 2002
[Quantity in million cubic feet, unless otherwise noted. Value in thousands of dollars]

Product code	Product description	Quantity produced	Quantity shipped	Value of shipments	Quantity produced and consumed in plant
	TOTAL 2002				
3251201	Acetylene	2,618	2,054	56,396	(D)
3251201111	Produced for compression, including cylinder and pipeline	(D)	(D)	(D)	(X)
3251201121	Produced for pipeline shipment, excluding that shipped to be compressed, and for consumption in same plant	(D)	(D)	(D)	(D)
3251204	Carbon dioxide (short tons)	12,505,224	14,505,219	410,945	355,282
3251204111	Gas, including amounts produced and liquefied	5,081,134	4,917,642	(S)	(D)
3251204121	Liquid, including amounts produced and and used to make dry ice	7,007,979	9,172,897	(S)	(D)
3251204131	Solid (dry ice)	416,111	414,680	33,076	(D)
325120D121	Argon, high purity: Produced for cylinder and bulk delivery and pipeline shipments, and for consumption in same plant	18,661	18,558	458,404	(D)
325120D pt.	Hydrogen	478,533	328,591	1,043,487	109,059
	Gas produced for:				
325120D131	Merchant shipment	646	857	7,261	(X)
325120D141	Pipeline and on-site use	293,696	309,993	894,461	(X)
325120D151	Consumption in same plant	166,439	(X)	(X)	109,059
	Liquid produced for:				
325120D161	Merchant shipment	(D)	(D)	(D)	(X)
325120D171	Other shipments or uses	(D)	(D)	(D)	(X)
3251207	Nitrogen	918,983	791,876	1,374,525	11,562
	Gas produced by:				
3251207111	Cryogenic on-site and pipeline	600,997	517,049	512,178	(X)
3251207121	Noncryogenic processes by industrial gas producing companies, including psa, vpsa, membrane, etc.	(D)	(D)	(D)	(X)
	Captive uses for consumption in same plant (user owned):				
3251207131	Cryogenic processes	26,230	(X)	(X)	(D)
3251207141	Noncryogenic processes, including psa, vpsa, membrane, etc.	(D)	(X)	(X)	(D)
	Liquid produced for:				
3251207151	Merchant shipment	243,023	238,138	(S)	(X)
3251207161	Consumption in same plant	10,871	(X)	(X)	(D)
3251207171	Other shipments or uses	25,664	(D)	(D)	(X)
325120A	Oxygen	605,745	521,723	795,574	(D)
	Gas produced by:				
325120A111	Cryogenic on-site and pipeline	438,326	393,105	(S)	(X)
325120A121	Noncryogenic processes by industrial gas producing companies, including psa, vpsa, membrane, etc.	(D)	(D)	(D)	(X)
	Captive uses for consumption in same plant (user owned):				
325120A131	Cryogenic processes	(S)	(X)	(X)	(D)
325120A141	Noncryogenic processes, including psa, vpsa, membrane, etc.	(D)	(X)	(X)	(D)
	Liquid produced for:				
325120A151	Merchant shipment	92,514	87,511	182,660	(X)
325120A161	Consumption in same plant	(D)	(X)	(X)	(D)
325120A171	Other shipments or uses	26,180	(D)	(D)	(X)

Continued

Table 2b. Primary Production of Specified Industrial Gases: 2002
[Quantity in million cubic feet, unless otherwise noted. Value in thousands of dollars]

Product code	Product description		Quantity produced		Quantity shipped		Value of shipments	Quantity produced and consumed in plant
	FOURTH QUARTER 2002							
3251201	Acetylene		655		504		12,439	(D)
3251201111	Produced for compression, including cylinder and pipeline		(D)		(D)		(D)	(X)
3251201121	Produced for pipeline shipment, excluding that shipped to be compressed, and for consumption in same plant		(D)		(D)		(D)	(D)
3251204	Carbon dioxide (short tons)		3,032,514		3,275,606		83,970	96,727
3251204111	Gas, including amounts produced and liquefied	a/	1,400,966	c/	1,335,251		(S)	(D)
3251204121	Liquid, including amounts produced and and used to make dry ice	b/	1,529,974	c/	1,839,886	b/	66,116	(D)
3251204131	Solid (dry ice)	c/	101,574	c/	100,469	c/	7,972	(D)
325120D121	Argon, high purity: Produced for cylinder and bulk delivery and pipeline shipments, and for consumption in same plant	b/	5,444	a/	6,100	c/	124,025	(D)
325120D pt.	Hydrogen		117,209		78,223		248,786	27,775
	Gas produced for:							
325120D131	Merchant shipment	b/	165	c/	217	b/	1,844	(X)
325120D141	Pipeline and on-site use	b/	72,890	b/	73,546	c/	205,992	(X)
325120D151	Consumption in same plant		39,671		(X)		(X)	27,775
	Liquid produced for:							
325120D161	Merchant shipment		(D)		(D)		(D)	(X)
325120D171	Other shipments or uses		(D)		(D)		(D)	(X)
3251207	Nitrogen		235,779		208,113		593,152	2,617
	Gas produced by:							
3251207111	Cryogenic on-site and pipeline	b/	142,831	a/	133,523	c/	132,259	(X)
3251207121	Noncryogenic processes by industrial gas producing companies, including psa, vpsa, membrane, etc.		(D)		(D)		(D)	(X)
	Captive uses for consumption in same plant (user owned):							
3251207131	Cryogenic processes	a/	6,519		(X)		(X)	(D)
3251207141	Noncryogenic processes, including psa, vpsa, membrane, etc.		(D)		(X)		(X)	(D)
	Liquid produced for:							
3251207151	Merchant shipment	c/	73,777	c/	65,187		(S)	(X)
3251207161	Consumption in same plant		2,719		(X)		(X)	(D)
3251207171	Other shipments or uses	b/	6,604		(D)		(D)	(X)
325120A	Oxygen		168,558		141,295		297,534	4,117
	Gas produced by:							
325120A111	Cryogenic on-site and pipeline	b/	121,989	a/	106,062		(S)	(X)
325120A121	Noncryogenic processes by industrial gas producing companies, including psa, vpsa, membrane, etc.		(D)		(D)		(D)	(X)
	Captive uses for consumption in same plant (user owned):							
325120A131	Cryogenic processes	b/	7,502		(X)		(X)	(D)
325120A141	Noncryogenic processes, including psa, vpsa, membrane, etc.		(D)		(X)		(X)	(D)
	Liquid produced for:							
325120A151	Merchant shipment	c/	27,364	c/	24,305	c/	58,483	(X)
325120A161	Consumption in same plant		(D)		(X)		(X)	(D)
325120A171	Other shipments or uses	b/	6,777		(D)		(D)	(X)

Continued

Table 2b. Primary Production of Specified Industrial Gases: 2002
[Quantity in million cubic feet, unless otherwise noted. Value in thousands of dollars]

Product code	Product description		Quantity produced		Quantity shipped		Value of shipments	Quantity produced and consumed in plant
	THIRD QUARTER 2002							
3251201	Acetylene		663		468		11,274	(D)
3251201111	Produced for compression, including cylinder and pipeline		(D)		(D)		(D)	(X)
3251201121	Produced for pipeline shipment, excluding that shipped to be compressed, and for consumption in same plant		(D)		(D)		(D)	(D)
3251204	Carbon dioxide (short tons)		3,173,584		3,484,985		89,613	75,272
3251204111	Gas, including amounts produced and liquefied	a/	1,216,568	b/	1,165,239		(S)	62,116
3251204121	Liquid, including amounts produced and and used to make dry ice	b/	1,841,967	c/	2,203,682	b/	70,479	(D)
3251204131	Solid (dry ice)	c/	115,049	c/	116,064	c/	9,615	(D)
325120D121	Argon, high purity: Produced for cylinder and bulk delivery and pipeline shipments, and for consumption in same plant	b/	3,994	c/	4,405	c/	132,791	(D)
325120D pt.	Hydrogen		116,380		78,667		256,254	27,589
	Gas produced for:							
325120D131	Merchant shipment	b/	142	c/	193	b/	1,638	(X)
325120D141	Pipeline and on-site use	b/	68,530	b/	74,147	c/	218,946	(X)
325120D151	Consumption in same plant	a/	43,424		(X)		(X)	27,589
	Liquid produced for:							
325120D161	Merchant shipment		(D)		(D)		(D)	(X)
325120D171	Other shipments or uses		(D)		(D)		(D)	(X)
3251207	Nitrogen		201,153		168,821		250,693	2,600
	Gas produced by:							
3251207111	Cryogenic on-site and pipeline	b/	129,641	b/	106,755	c/	113,882	(X)
3251207121	Noncryogenic processes by industrial gas producing companies, including psa, vpsa, membrane, etc.		(D)		(D)		(D)	(X)
	Captive uses for consumption in same plant (user owned):							
3251207131	Cryogenic processes	c/	6,156		(X)		(X)	(D)
3251207141	Noncryogenic processes, including psa, vpsa, membrane, etc.		(D)		(X)		(X)	(D)
	Liquid produced for:							
3251207151	Merchant shipment	c/	54,431	a/	54,106		(S)	(X)
3251207161	Consumption in same plant		2,474		(X)		(X)	(D)
3251207171	Other shipments or uses	b/	6,034		(D)		(D)	(X)
325120A	Oxygen		137,290		118,754		171,661	4,014
	Gas produced by:							
325120A111	Cryogenic on-site and pipeline	b/	99,636	b/	88,825		(S)	(X)
325120A121	Noncryogenic processes by industrial gas producing companies, including psa, vpsa, membrane, etc.		(D)		(D)		(D)	(X)
	Captive uses for consumption in same plant (user owned):							
325120A131	Cryogenic processes		(S)		(X)		(X)	(D)
325120A141	Noncryogenic processes, including psa, vpsa, membrane, etc.		(D)		(X)		(X)	(D)
	Liquid produced for:							
325120A151	Merchant shipment	c/	20,730	c/	21,135	c/	45,912	(X)
325120A161	Consumption in same plant		(D)		(X)		(X)	(D)
325120A171	Other shipments or uses	b/	6,076		(D)		(D)	(X)

Continued

Table 2b. Primary Production of Specified Industrial Gases: 2002
[Quantity in million cubic feet, unless otherwise noted. Value in thousands of dollars]

Product code	Product description		Quantity produced		Quantity shipped		Value of shipments	Quantity produced and consumed in plant
	SECOND QUARTER 2002							
3251201	Acetylene		656		548		14,947	(D)
3251201111	Produced for compression, including cylinder and pipeline		(D)		(D)		(D)	(X)
3251201121	Produced for pipeline shipment, excluding that shipped to be compressed, and for consumption in same plant		(D)		(D)		(D)	(X)
3251204	Carbon dioxide (short tons)		3,250,814		3,737,311		99,489	93,604
3251204111	Gas, including amounts produced and liquefied	a/	1,262,040	b/	1,294,138	c/	11,570	82,617
3251204121	Liquid, including amounts produced and and used to make dry ice	b/	1,884,245	c/	2,344,025		(S)	(D)
3251204131	Solid (dry ice)	c/	104,529	c/	99,148	c/	7,443	(D)
325120D121	Argon, high purity: Produced for cylinder and bulk delivery and pipeline shipments, and for consumption in same plant	b/	4,776	b/	4,162	c/	102,391	(D)
325120D pt.	Hydrogen		127,247		86,726		248,597	27,581
	Gas produced for:							
325120D131	Merchant shipment	b/	160	c/	211	b/	1,779	(X)
325120D141	Pipeline and on-site use	b/	79,367	b/	82,218	c/	218,123	(X)
325120D151	Consumption in same plant	a/	43,402		(X)		(X)	27,581
	Liquid produced for:							
325120D161	Merchant shipment		(D)		(D)		(D)	(X)
325120D171	Other shipments or uses		(D)		(D)		(D)	(X)
3251207	Nitrogen		237,543		198,241		189,649	3,244
	Gas produced by:							
3251207111	Cryogenic on-site and pipeline	b/	159,654	a/	132,051	c/	122,726	(X)
3251207121	Noncryogenic processes by industrial gas producing companies, including psa, vpsa, membrane, etc.		(D)		(D)		(D)	(X)
	Captive uses for consumption in same plant (user owned):							
3251207131	Cryogenic processes	c/	6,875		(X)		(X)	(D)
3251207141	Noncryogenic processes, including psa, vpsa, membrane, etc.		(D)		(X)		(X)	(D)
	Liquid produced for:							
3251207151	Merchant shipment	b/	58,247	b/	56,449		(S)	(X)
3251207161	Consumption in same plant		2,824		(X)		(X)	(D)
3251207171	Other shipments or uses	b/	6,677		(D)		(D)	(X)
325120A	Oxygen		155,120		134,018		165,993	4,450
	Gas produced by:							
325120A111	Cryogenic on-site and pipeline	b/	112,329	a/	101,909		(S)	(X)
325120A121	Noncryogenic processes by industrial gas producing companies, including psa, vpsa, membrane, etc.		(D)		(D)		(D)	(X)
	Captive uses for consumption in same plant (user owned):							
325120A131	Cryogenic processes		8,090		(X)		(X)	(D)
325120A141	Noncryogenic processes, including psa, vpsa, membrane, etc.		(D)		(X)		(X)	(D)
	Liquid produced for:							
325120A151	Merchant shipment	c/	22,828	c/	21,158	c/	38,989	(X)
325120A161	Consumption in same plant		(D)		(X)		(X)	(D)
325120A171	Other shipments or uses	b/	6,860		(D)		(D)	(X)

Continued

Table 2b. Primary Production of Specified Industrial Gases: 2002
[Quantity in million cubic feet, unless otherwise noted. Value in thousands of dollars]

Product code	Product description		Quantity produced		Quantity shipped		Value of shipments		Quantity produced and consumed in plant
	FIRST QUARTER 2002								
3251201	Acetylene		644		535		17,736		(D)
3251201111	Produced for compression, including cylinder and pipeline		(D)		(D)		(D)		(X)
3251201121	Produced for pipeline shipment, excluding that shipped to be compressed, and for consumption in same plant		(D)		(D)		(D)		(D)
3251204	Carbon dioxide (short tons)		3,048,312		4,007,317		137,873		89,679
3251204111	Gas, including amounts produced and liquefied	a/	1,201,560	b/	1,123,014		(S)		79,935
3251204121	Liquid, including amounts produced and and used to make dry ice	b/	1,751,793	c/	2,785,304		(S)		(D)
3251204131	Solid (dry ice)	c/	94,959	c/	98,999	c/	8,046		(D)
325120D121	Argon, high purity: Produced for cylinder and bulk delivery and pipeline shipments, and for consumption in same plant	b/	4,447	b/	3,891	c/	99,197		(D)
325120D pt.	Hydrogen		117,654		84,976		289,850		26,115
	Gas produced for:								
325120D131	Merchant shipment	b/	179	c/	237	b/	2,000		(X)
325120D141	Pipeline and on-site use	b/	72,909	b/	80,084	c/	251,580		(X)
325120D151	Consumption in same plant	a/	39,942		(X)		(X)	a/	26,115
	Liquid produced for:								
325120D161	Merchant shipment		(D)		(D)		(D)		(X)
325120D171	Other shipments or uses		(D)		(D)		(D)		(X)
3251207	Nitrogen		244,609		216,701		341,031		3,121
	Gas produced by:								
3251207111	Cryogenic on-site and pipeline	a/	168,871	a/	144,719	c/	143,311		(X)
3251207121	Noncryogenic processes by industrial gas producing companies, including psa, vpsa, membrane, etc.		(D)		(D)		(D)		(X)
	Captive uses for consumption in same plant (user owned):								
3251207131	Cryogenic processes	c/	6,681		(X)		(X)		(D)
3251207141	Noncryogenic processes, including psa, vpsa, membrane, etc.		(D)		(X)		(X)		(D)
	Liquid produced for:								
3251207151	Merchant shipment	b/	56,569	c/	62,396		(S)		(X)
3251207161	Consumption in same plant		2,853		(X)		(X)		(D)
3251207171	Other shipments or uses	b/	6,349		(D)		(D)		(X)
325120A	Oxygen		144,778		127,656		160,386		(D)
	Gas produced by:								
325120A111	Cryogenic on-site and pipeline	a/	104,373	a/	96,310		(S)		(X)
325120A121	Noncryogenic processes by industrial gas producing companies, including psa, vpsa, membrane, etc.		(D)		(D)		(D)		(X)
	Captive uses for consumption in same plant (user owned):								
325120A131	Cryogenic processes		(S)		(X)		(X)		(D)
325120A141	Noncryogenic processes, including psa, vpsa, membrane, etc.		(D)		(X)		(X)		(D)
	Liquid produced for:								
325120A151	Merchant shipment	c/	21,593	c/	20,913	c/	39,276		(X)
325120A161	Consumption in same plant		(D)		(X)		(X)		(D)
325120A171	Other shipments or uses	b/	6,468		(D)		(D)		(X)

pt. Part. D Withheld to avoid disclosing data for individual companies. S Does not meet publication standards.
X Not applicable.

Note: Percent of estimation of each item is indicated as follows: a/10 to 25 percent of this item is estimated.
b/26 to 50 percent of this item is estimated. c/Over 50 percent of this item is estimated.

Continued

Table 3. Production, Exports, Imports, and Apparent Consumption of Industrial Gases
[Million cubic meters, unless otherwise noted]

Product code	Product description	Manufacturers' production	Exports of domestic merchandise 1/	Percent exports to manufacturers' net production	Imports for consumption 2/	Apparent consumption 3/	Percent imports to apparent consumption
	2003						
3251204	Carbon dioxide, gas, liquid, and solid (metric tons)	11,165,324	102,722	0.9	41,175	11,103,777	0.4
325120D121	Argon	608	149	24.5	24	483	5.0
325120D131, 141, 151, 161, 171	Hydrogen	14,376	411	2.9	156	14,121	1.1
3251207	Nitrogen	26,560	78	0.3	59	26,541	0.2
325120A	Oxygen	19,760	85	0.4	33	19,708	0.2
	2002						
3251204	Carbon dioxide, gas, liquid, and solid (metric tons)	11,352,242	76,874	0.7	38,110	11,313,478	0.3
325120D121	Argon	528	209	39.5	23	342	6.7
325120D131, 141, 151, 161, 171	Hydrogen	13,552	415	3.1	141	13,278	1.1
3251207	Nitrogen	26,026	76	0.3	188	26,138	0.7
325120A	Oxygen	17,155	101	0.6	37	17,091	0.2

1/Source: Census Bureau report EM 545, U.S. Exports.
2/Source: Census Bureau report IM 145, U.S. Imports for Consumption.
3/Apparent consumption is derived by subtracting exports from the total of net production plus imports.

Note: For comparison of North American Industry Classification System (NAICS)-based product codes with Schedule B export codes and HTSUSA import codes, see Table 4.

Table 4. Comparison of North American Industry Classification System (NAICS)-Based Product Codes with Schedule B Export Codes and HTSUSA Import Codes: 2003

Product code	Product description	Export code 1/	Import code 2/
3251204	Carbon dioxide, gas, liquid, and solid (metric tons).....	2811.21.0000	2811.21.0000
325120D121	Argon, high purity.....	2804.21.2000	2804.21.2000
325120D131, 141, 151, 161, 171	Hydrogen.....	2804.10.0000	2804.10.0000
3251207	Nitrogen.....	2804.30.0000	2804.30.0000
325120A	Oxygen.....	2804.40.0000	2804.40.0000

1/Source: 2003 edition, Harmonized System-based Schedule B, Statistical Classification of Domestic and Foreign Commodities Exported from the United States.

2/Source: Harmonized Tariff Schedule of the United States, annotated (2003).

Appendix.
General CIR Survey Information, Explanation of General Terms and Historical Note

GENERAL

The CIR program has been providing monthly, quarterly, and annual measures of industrial activity for many years. Since 1904, with its cotton and fats and oils surveys, the CIR program has formed an essential part of an integrated statistical system involving the quinquennial economic census, manufacturing sector, and the annual survey of manufactures. The CIR surveys, however, provide current statistics at a more detailed product level than either of the other two statistical programs.

The primary objective of the CIR program is to produce timely, accurate data on production and shipments of selected products. The data are used to satisfy economic policy needs and for market analysis, forecasting, and decision making in the private sector. The product-level data generated by these surveys are used extensively by individual firms, trade associations, and market analysts in planning or recommending marketing and legislative strategies, particularly if their industry is significantly affected by foreign trade. Although production and shipments information are the two most common data items collected, the CIR program collects other measures also such as inventories, orders, and consumption. These surveys measure manufacturing activity in important commodity areas such as textiles and apparel, chemicals, primary metals, computer and electronic components, industrial equipment, aerospace equipment, and consumer goods.

The CIR program uses a unified data collection, processing, and publication system. The U.S. Census Bureau updates the survey panels for most reports annually and reconciles the estimates to the results of the broader-based annual survey of manufactures and the economic census, manufacturing sector. The manufacturing sector provides a complete list of all producers of the products covered by the CIR program and serves as the primary source for CIR sampling. Where a small number of producers exist, CIR surveys cover all known producers of a product. However, when the number of producers is too large, cutoff and random sampling techniques are used. Surveys are continually reviewed and modified to provide the most up-to-date information on products produced. The CIR program includes a group of mandatory and voluntary surveys. Typically the monthly and quarterly surveys are conducted on a voluntary basis. Those companies that choose not to respond to the voluntary surveys are required to submit a mandatory annual counterpart corresponding to the more frequent survey.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS), 1997

The adoption of the North American Industry Classification System (NAICS) in the 1997 Economic Census has had a major impact on the comparability of current and historic data. Approximately half of the industries in the manufacturing sector of NAICS do not have comparable industries in the Standard Industrial Classification (SIC) system that was used in the past.

While most of the change affecting the manufacturing sector was change within the sector, some industries left manufacturing and others came into manufacturing. Prominent among those that left manufacturing are logging and portions of publishing. Prominent among the industries that came into the manufacturing sector are bakeries, candy stores where candy is made on the premises, custom tailors, makers of custom draperies, and tire retreading. The net effect of the classification changes are such that if the 1997 value of shipments data for all manufacturers were tabulated on an SIC basis, it would be approximately 3 percent higher.

Listed below are the NAICS sectors:

21 Mining
22 Utilities
23 Construction
31-33 Manufacturing
42 Wholesale Trade
44-45 Retail Trade
48-49 Transportation and Warehousing
51 Information
52 Finance and Insurance
53 Real Estate and Rental and Leasing
54 Professional, Scientific, and Technical Services
55 Management of Companies and Enterprises
56 Administrative and Support and Waste Management and Remediation Services
61 Educational Services
62 Health Care and Social Assistance
71 Arts, Entertainment, and Recreation
72 Accommodation and Food Services
81 Other Services (except Public Administration)

(Not listed above are the Agriculture, Forestry, Fishing, and Hunting sector (NAICS 11), partially covered by the census of agriculture conducted by the U.S. Department of Agriculture, and the Public Administration sector (NAICS 92), covered by the census of governments conducted by the Census Bureau.)

The 20 NAICS sectors are subdivided into 96 subsectors (three-digit codes), 313 industry groups (four-digit codes), and, as implemented in the United States, 1170 industries (five- and six-digit codes).

FUNDING

The Census Bureau funds most of the surveys. However, a number of surveys are paid for either fully or partially by other Federal Government agencies or private trade associations. A few surveys are mandated, but all are authorized by Title 13 of the United States Code.

RELIABILITY OF DATA

Survey error may result from several sources including the inability to obtain information about all cases in the survey, response errors, definitional difficulties, differences in the interpretation of questions, mistakes in recording or coding the reported data, and other errors of collection, response, coverage, and estimation. These nonsampling errors also occur in complete censuses. Although no direct measurement of the biases due to these nonsampling errors has been obtained, precautionary steps were taken in all phases of the collection, processing, and tabulation of the data in an effort to minimize their influence.

A major source of bias in the published estimates is the imputing of data for nonrespondents, for late reporters, and for data that fail logic edits. Missing figures are imputed based on period-to-period movements shown by reporting firms. A figure is considered to be an impute if the value was not directly reported on the questionnaire, directly derived from other reported items, directly available from supplemental sources, or obtained from the respondent during the analytical review phase. Imputation generally is limited to a maximum of 10 percent for any one data cell. Figures with imputation rates greater than 10 percent are suppressed or footnoted. The imputation rate is not an explicit indicator of the potential error in published figures due to nonresponse, because the actual yearly movements for nonrespondents may or may not closely agree with the imputed movements. The range of difference between the actual and imputed figures is assumed to be small. The degree of uncertainty regarding the accuracy of the published data increases as the percentage of imputation increases. Figures with imputation rates above 10 percent should be used with caution.

DATA REVISIONS

Statistics for previous years may be revised as the result of corrected figures from respondents, late reports for which imputations were originally made, or other corrections. Data that have been revised by more than 5 percent from previously published data are indicated by footnotes.

DISCLOSURE

The Census Bureau collects the CIR data under the authority of Title 13, United States Code, which specifies that the information can only be used for statistical purposes and cannot be published or released in any manner that would identify a person, household, or establishment. "D" indicates that data in the cell have been suppressed to avoid disclosure of information pertaining to individual companies.

EXPLANATION OF GENERAL TERMS

Capacity. The maximum quantity of a product that can be produced in a plant in 1 day if operating for 24 hours. Includes the capacity of idle plants until the plant is reported to be destroyed, dismantled, or abandoned.

Consumption. Materials used in producing or processing a product or otherwise removing the product from the inventory.

Exports. Includes all types of products shipped to foreign countries, or to agents or exporters for reshipment to foreign countries.

Gross shipments. The quantity or value of physical shipments from domestic establishments of all products sold, transferred to other establishments of the same company, or shipped on consignment, whether for domestic or export sale or use. Shipments of products purchased for resale are omitted. Shipments of products made under toll arrangements are included.

Interplant transfers. Shipments to other domestic plants within a company for further assembly, fabrication, or manufacture.

Inventories. The quantity or value of finished goods, work in progress, and materials on hand.

Machinery in place. The number of machines of a particular type in place as of a particular date whether the machinery was used for production, prototype, or sampling, or was idle. Machinery in place includes all machinery set up in operating positions.

Net receipts. Derived by subtracting the materials held at the end of the previous month from the sum of materials used during the current month.

Production. The total volume of products produced, including: products sold; products transferred or added to inventory after adjustments for breakage, shrinkage, and obsolescence, plus any other inventory adjustment; and products that undergo further manufacture at the same establishment.

Quantities produced and consumed. Quantities of each type of product produced by a company for internal consumption within that same company.

Quantity and value of new orders. The sales value of orders received during the current reporting period for products and services to be delivered immediately or at some future date. Also represents the net sales value of contract change documents that increase or decrease the sales value of the orders to which they are related, when the parties concerned are in substantial agreement as to the amount involved. Included as orders are only those that are supported by binding legal documents such as signed contracts or letter contracts.

Quantity and value of shipments. The figures on quantity and value of shipments represent physical shipments of all products sold, transferred to other establishments of the same company, or shipped on consignment, whether for domestic or export sale. The value represents the net sales price, f.o.b. plant, to the customer or branch to which the products are shipped, net of discounts, allowances, freight charges, and returns. Shipments to a company's own branches are assigned the same value as comparable appropriate allocation of company overhead and profit. Products bought and resold without further manufacture are excluded.

Stocks. Total quantity of ending finished inventory.

Unfilled orders (backlog). Calculated by adding net new orders and subtracting net sales from the backlog at the end of the preceding year.

HISTORICAL NOTE

Data on industrial gases have been collected by the Census Bureau since 1941. Prior to 1991, data were collected both monthly and annually. Beginning in 1991, as a result of budget reductions, the monthly series was canceled and replaced with a similar quarterly series. Historical data may be obtained from Current Industrial Reports (called Facts for Industry before 1959) available at your local Federal Depository Library.